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SUMMARY OF MIDSOUTH PEST CONDITIONS IN 1957

FOREST INSECTS

During 1957 no major outbreaks of forest insects occurred in the Midsouth, but a variety of insects caused numerous small infestations. These disturbances, in the aggregate, have resulted in substantial losses.

The southern pine beetle, because of its unpredictable nature and ability to increase rapidly to epidemic proportions, has been a constant challenge. Beginning outbreaks were discovered and quickly suppressed in Louisiana, southwest Mississippi, and east Texas, although in the latter State new attacks continue to appear. The beetle has also increased rapidly on private lands in east-central Alabama. Timber owners have been warned of the potential seriousness of the situation, but so far have taken little action. No activity of the southern pine beetle has been observed in Oklahoma, Arkansas, west Tennessee, or west Florida.

The black turpentine beetle has infested many tracts on flooded sites and cutting areas on Federal, State, and private lands. Early detection and prompt action have kept timber mortality to a minimum, but in recent years forest industry has spent more money in combating the turpentine beetle than any other forest pest.

The severe 1956 outbreak of Ips bark beetles in east Texas, Oklahoma, and Arkansas ended in early 1957. Heavy rains in these former drought areas are believed to have improved the vigor of the trees and made them less vulnerable to beetle attack. Even in southwest Louisiana, where Hurricane Audrey blew down much pine timber, an anticipated Ips buildup failed to develop.

Southern Pine Beetle

Louisiana.--In March an incipient outbreak of the southern pine beetle was discovered north of Baton Rouge. This is believed to be the first authentic record of the beetle's activity in Louisiana in 40 years. The area principally involved was a neglected stand about one mile square, but several smaller infestations were present in the vicinity. Single infested trees were later found in other parts of the State.

The Louisiana Forestry Commission immediately notified timber owners of the danger and, with the Southern Forest Experiment Station, conducted a State-wide aerial survey in April and May. Most of the trouble was found to be confined to East Feliciana and East Baton Rouge parishes, close to the State line bordering southwest Mississippi. The landowners cut and sprayed the infested trees and when the two parishes were reflowed in June and September no fresh outbreaks were seen. The quick action by the State Forestry Commission, the concern of industry, and the cooperation of small timber owners prevented what might have been a serious outbreak.

In future months it will be well to keep a close watch for further beetle development, especially on poorly managed and neglected stands in small ownerships.

Southwest Mississippi.--From 1952 to 1954 the southern pine beetle was epidemic on the Homochitto National Forest and private lands in southwest Mississippi. With a great deal of effort the beetle was brought under control, although small sporadic outbursts still occurred. As the epidemic declined, cutting and spraying crews on the National Forest were reduced to a skeleton force and maintenance control was put into effect. On private lands control was stopped because of the scarcity of beetle-infested trees.

In July, an aerial survey revealed an alarming increase of the beetle. There were estimated to be 140 spots of dead and dying timber, mostly on the southern portion of the Homochitto and adjacent private lands. Most spots were less than a half-acre, but a few covered 2 to 5

acres. The beetles, especially on Federal land, were very prolific and active. Experienced crews promptly went into action and cut and sprayed or salvaged all known beetle trees--a total of 13,430, representing 1,204,000 board feet.

Operational flights were made in August and September by ranger personnel, but only a few new infestations could be found on the National Forest.

On private lands, some beetle spots are still unchecked. What will happen on these lands remains to be seen.

East Texas.--Since the end of the 1950-51 epidemic in east Texas, a constant watch for the beetle has been maintained. During 1956 occasional salvaged trees harboring the beetle were found on one skidway at Honey Island, but field scouting and aerial surveys of the stands from which the logs were removed failed to locate the source.

In January, during an inspection of a 10-acre burn near Honey Island, several infested trees were discovered. All were immediately cut and sprayed. In February, another fire occurred adjacent to the older burn, and later fresh scattered attacks were found therein and in nearby green timber. The infested trees were cut and sprayed, but not so quickly as they should have been.

In June an aerial survey was made over southeast Texas, and particular attention was given to former epidemic areas, including that near Honey Island. No infested trees were observed.

In September another aerial survey was made. Approximately two miles from the burned Honey Island stands a 2-acre group of dead and dying pines was observed. Ground inspections revealed an active infestation of the southern pine beetle. Several smaller and less active spots have since been found nearby, but inaccessibility and deep floodwaters have delayed thorough scouting and have hampered control.

Further aerial observations in October were made difficult by autumn hardwood coloration, but ground inspections in December located fresh scattered attacks in the Honey Island area. Infested trees were more plentiful and more heavily attacked than earlier in the year. It is evident that the southern pine beetle is building up in east Texas. Every effort should be made to stamp out incipient infestations as quickly as they appear.

Alabama.-Monthly operational flights and maintenance control were necessary to hold the southern pine beetle in check on the Talladega and Bankhead National Forests, and to subdue sporadic outbursts on industrial lands in southern Alabama. In the east-central part of the State, small scattered infestations developed during the early part of the season but natural factors prevented appreciable spread. Timber owners hesitated to take action, since control costs did not seem to be justified. Periodic aerial surveys were made to keep watch on developments.

In August an aerial survey disclosed a rapid increase of the southern pine beetle on private lands in the east-central portion. In approximately 500 square miles around Lake Martin, Tallapoosa County, there were estimated to be 250 groups of recently killed and dying pines. The spots were much more numerous and larger than before, and the beetles more aggressive.

Timber owners were informed of the danger and urged to control the beetles as quickly as possible. To date, little or no organized action has been taken. A serious outbreak in 1958 is probable.

Black Turpentine Beetle

The black turpentine beetle has continued to be troublesome in stands disturbed by wildfire, summer flooding, and logging. Most outbreaks have been confined to selectively logged stands on low, poorly drained sites, but some infestations have spread to higher land. Usually high-value trees are involved--seed trees left to provide for future stocking and residual trees that have not reached their peak in timber value.

Often the beetles concentrate on stumps and damaged trees near logging trails, and only lightly attack the remaining timber. Because of the high value of the residual stand, however, timber owners become concerned at the mere presence of the insect and may spray or even cut trees when such practices are unnecessary.

When beetles are numerous and valuable trees are at stake, it becomes important to decide which trees can be saved by spraying and which should be cut for salvage. If attacks are light or discovered early enough, trees will recover if properly sprayed. In advanced stages of attack, however, there are always borderline cases where decisions are hard to make. Timely rains sometimes enable severely weakened trees to recover, while dry weather may kill pines only slightly weakened by the beetles.

Ips Engraver Beetles

During the fall and early winter of 1956 many millions of board feet of pine timber were killed in east Texas, Oklahoma, and Arkansas by a combination of drought and Ips beetle attack. Heavy losses also occurred in other areas of extreme rainfall deficiencies. The outbreak subsided during the winter, but by spring beetle numbers were still substantial. It was feared that the epidemic would carry over into the summer of 1957.

Torrential rains in May and near-normal precipitation for the rest of the 1957 growing season helped to restore the vigor of trees in the drought-stricken areas. Ips beetle populations were suddenly and materially reduced and by mid-summer were confined mostly to lightning-struck and otherwise weakened trees. Even in the hurricane blow-down area in southwest Louisiana, an expected Ips outbreak did not materialize.

Miscellaneous Pine Insects

The Nantucket pine tip moth was more prevalent than usual and caused deformity and marked reduction in growth in many young plantations. It also attracted attention in several States by attacking trees of pulpwood and sawtimber size.

The loblolly pine sawfly made its annual spring appearance in Arkansas, and the red-headed pine sawfly caused repeated, widespread, and often severe defoliation in young plantations throughout the year; it was especially prevalent in east Texas and west Florida. During the fall and early winter, a sawfly tentatively identified as Neodiprion exitans partially defoliated pines of all sizes in Arkansas, Texas, Louisiana, and Mississippi.

A short-tailed cricket, Anurogryllus muticus, killed newly germinated pine seedlings on direct-seeding experimental plots in Louisiana. It was also noticed in east Texas and Arkansas. White grubs are reported to have killed a million nursery seedlings in Arkansas, and did localized damage to 1-year-old pine plantations elsewhere. Further damage may be expected during the winter and spring.

Preliminary results from tests in east Texas indicate that damage by the pales weevil and pitch-eating weevil can be avoided if 6 to 9 months are allowed to elapse between the time pines are harvested and new stands planted. During this time, the stumps become unattractive to beetles. Thus if a pine stand is cut between January and May, pine seedlings probably can be safely planted on the same area the following December.

Texas Leaf-Cutting Ant

In June, representatives of agricultural and forestry activities met at Alexandria, Louisiana, to consider methods of controlling the Texas leaf-cutting ant. Many landowners are not satisfied with the present recommendations for controlling ant colonies by fumigating them with methyl bromide. Some complain that colonies that at first appear to be eradicated become active again in several months to a year, thus requiring repeated treatment. It was agreed that, if an improved method could be developed, timber owners could not only destroy the ants on their lands but could also recommend large-scale control on adjacent lands, especially those in small ownerships.

In an attempt to assemble information regarding the economic importance of the town ant as a deterrent to reforestation, the Louisiana Forestry Association circulated a questionnaire to 40 foresters representing industry and the national forests in the infested areas of Louisiana and Texas.

The replies made clear that the most obvious destruction caused by the ants is to planted seedlings. Entire plantations may be wiped out within a few days. Greatest mortality occurs immediately after planting, but seedlings up to 4 years of age may be destroyed. Twenty-two of the 40 foresters reported an infested plantable area of over 1,250,000 acres and 9 claimed losses of 722,100 seedlings in 1955 and 675,600 in 1956. Others have reduced losses by fumigating with methyl bromide.

Twenty-two foresters reported that they had treated town ant colonies on 82,000 acres in the 1956-57 planting season; approximately 14,700 towns were fumigated with methyl bromide and 3,400 required re-treatment. The cost was \$32,500, or about \$1.80 per treatment. These figures include the cost of the chemical and the labor involved in scouting and control.

There is evidently a need for a more certain, more permanent, and cheaper method of control, although many of the failures are probably due to careless application of the present method.

Hardwood Insects

Elm leaf beetles caused light to severe defoliation of Chinese elms in all parts of Arkansas. Feeding was particular noticeable in towns and cities, where Chinese elms are most commonly found.

Partial to complete defoliation of oak shade trees and stands by larvae of Anisota sp. was prevalent in parts of east Texas in September.

A leaf miner, possibly Baliosus ruber, was reported feeding on overcup oak in Arkansas and Louisiana. Damage to oaks and other hardwoods by trunk borers was extensive during recent drought years and carried over into 1957.

Several insects continued to damage cottonwoods in nurseries and plantations in the Mississippi Delta. A twig borer, Gypsonoma sp., seriously stunted and deformed trees in some nurseries and plantations and a root and stem borer, Paranthrene dollii, has been common in plantings and natural growth. At Stoneville, Mississippi, several sprayings were necessary to control the cottonwood leaf beetle, Chrysomela scripta. One area of young natural cottonwood on a Mississippi River sandbar south of Greenville contained larvae of the cottonwood borer, Plectrodera scalator, in root crowns of 3-year-old seedlings; some of the trees broke off near the groundline. Aphids were common in August and stunted some terminals. Larvae of the viceroy butterfly were numerous in September and October, and killed some cottonwood terminal buds.

FOREST DISEASES

Nursery diseases. --Unlike 1956, when the nursery diseases were largely drought symptoms and heat injury, 1957 was characterized by damaging pathogenic diseases. Differences in the weather were responsible. Above-normal temperatures in January and February 1957 permitted a build-up of fusiform rust on oak. March and April were wet, making conditions favorable for heavy infection of pine seedlings. Even though they sprayed at weekly intervals, some nurseries lost 15 percent or more of their slash and loblolly seedlings. Infection ran as high as 50 percent in some beds. One nursery, where a spray was applied soon after each rain during the critical period of April and early May, sustained only minor loss. Because infected nursery seedlings will not survive outplanting, any with noticeable swellings on the stems should be culled. Infected seedlings often "feather" at the swelling, but feathering can result from other causes and only seedlings with swellings should be culled.

A severe rust year can be expected whenever a moist spring follows a warm, late winter. In such years, intensified spray schedules should be followed. If beds are sown by March 15, spraying should start as soon as the mulch is lifted. With later sowing, the first spray

should be made over the mulch as soon as germination starts. If the nursery is in an area where rust has been severe in some past year, sprayings through April should be made twice each week, or, even better, as soon after each rain as possible. During severe rust years the least slip-up in spraying can lead to disastrous infections.

The summer and fall were also wet, and thus favored the development of root rots. The root-rot fungus Sclerotium bataticola occurred in important amounts in several nurseries. Black root rot, with which both nematodes and fungi are associated, continued to be bothersome. Root rots can be controlled by soil fumigants, but if nematodes are not associated with the root rot some nemacides (notably ethylene dibromide) will not give good control because they are poor fungicides. Badly root-rotted seedlings should be culled.

Many seedlings were attacked in 1957 by the smothering fungus, Thelephora terrestris, which forms a brown to black "collar" at the ground line. Attacked seedlings should not be culled because the fungus is harmless on seedlings of plantable size.

Pine leaf diseases. --Needle fungi again appeared in epidemic proportions, attacking loblolly pines in widely separated locations in Mississippi, Louisiana, and Arkansas. Needle blight and cast caused by Scirrhia acicola and Hypoderma lethale again were prevalent in the winter and spring. In addition, a new needle disease was noted over a wide area in north Mississippi, north Louisiana, and south Arkansas in late summer (when Scirrhia and Hypoderma are inconspicuous on loblolly). The new disease affected only the distal half of the needle. Lophodermium was isolated from the dead tissue. The virulence of this fungus as a pathogen of southern pines has been questioned, but it appears to have caused epidemic killing of loblolly needles under the wet conditions that prevailed this year. The significance of these diseases is still unknown and no control measures for loblolly are recommended.

Sweetgum blight. --In 1957, for the first time, a reduction was noted in the rate of development of sweetgum blight in affected stands. That this occurred in a year of abundant rainfall substantiates recent research showing that the severity of blight development is correlated with soil factors that limit available water. The evidence is now very strong that sweetgum blight is mainly an expression of water shortage. The problem is to determine which diseased trees will recover and which should be salvaged.

Root rot. --Root rot killed large numbers of trees in a 20-year-old slash pine plantation in Bienville Parish, Louisiana. The root rot fungus Fomes annosus colonized stumps following thinning, spread out along roots, and attacked and killed adjacent trees. Surveys showed that this fungus is widely scattered over the South, but that it rarely kills many southern pines.

Red heart. --Heart rot caused by Fomes pini was an important cause of cull in old-growth southern pine, but second-growth, because of its low heartwood content, has usually escaped attack. However, appreciable amounts are being found in slow-growing stands where early heartwood formation is favored. Foresters aiming at sawlog rotations of dense stands, especially on poor sites, should be alert to signs of excessive infection of red heart.

Cone rust. --The slash pine cone crop along the coast of Mississippi and Alabama was appreciably reduced by an epidemic of cone rust. Infections in damaging proportions seldom occur in Mississippi and Alabama except for a 20-30 mile wide strip along the coast where evergreen oaks (the alternate host of the rust) abound. Until economical control measures are devised, seed orchards could well be located north of the heavy infection belt.

PINE SEED SOURCE STUDY PLANTATIONS

The Southwide Pine Seed Source Study, a cooperative venture between Federal, State, and private interests, is aimed primarily at determining the zones within which seed may be moved from collecting grounds to planting site. However, supplementary data on the occurrence of diseases and insects have been taken on some of the study plantations and summarized in a report by B. W. Henry and G. H. Hepting.

The report indicates that drought has caused most of the mortality so far. Fusiform rust is increasing rapidly and is expected to damage loblolly and slash plantings. Brown spot needle disease is being controlled in longleaf plantations with fungicides, but along with Hypoderma needle blight may be causing growth loss on loblolly. The Nantucket pine tip moth is widespread in loblolly and shortleaf plantations and may be retarding height growth appreciably. No other pests as yet appear significant.

NEW PUBLICATIONS

Single copies of the following publications are available on request to the Southern Forest Experiment Station, 704 Lowich Building, 2026 St. Charles Avenue, New Orleans 13, La.

Henry, B. W., and Hepting, G. H. 1957. Pest occurrences in 35 of the Southwide Pine Seed Source Study plantations during the first three years. Southern and Southeastern Forest Experiment Stations and the Southern Forest Tree Improvement Committee. 7 pp., illus.

McCambridge, Wm., and Rossoll, Harry. 1957. Recommended procedures for control of the southern pine beetle. U. S. Forest Serv. Southeastern Forest Experiment Station. 12 pp., illus.

Thatcher, R. C. 1957. References of value in studies of insects affecting the southern pines: an annotated list. Stephen F. Austin State Col. Bul. 1, 37 pp.